western corner, but, doubtless, the 80° isotherm will again be found just off the coast. Within this large area of 80°, the mean temperature diminishes to 74° or less as we ascend into the mountainous interior. It is doubtless owing to the prevailing northeast winds that the small region of 82° lies southwest, viz, to leeward, of the mountainous region. The winds and mountains also control the distribution of rainfall. The regions of small rainfall are two, viz, (1) in the southwest, where high temperature, minimum cloudiness, and descending winds prevail; (2) in the east where the northeast trade, after rising over the hills of Humacao and San Juan de Porto Rico, descend into Cayey and the valley of the Loiza, giving light rains and little cloudiness for a small portion of that region. The region of heaviest rainfall extended from western Ponce to the northern coast; the rainfall was also large at the extreme northeastern and northwestern corners.

The only stations for which the average rainfall is known so as to admit of comparisons are San Juan, Luquillo, and Mount Yunki, all three of which report less this year than the normal values. The greatest amount recorded anywhere was 11.36 inches at La Isolina. On the average of 11 stations, there were 14 clear days, 10 partly cloudy, and 7 cloudy days. The number of rainy days varied from 3, in the district of San German, to 11 or 12 in Arecibo and 19 or 20 at Luquillo and Mount Yunki, both in Humacao.

It is evident that about twice as many meteorological stations at carefully selected locations are still needed in order to better represent the distribution of rainfall. As the total area of the island is about 3,750 square miles, and its surface is very much diversified by hills and valleys, the 34 stations already established can only be considered as the first step toward the investigation of the many peculiarities of climate and the discovery of innumerable small regions adapted to the cultivation of special crops.

Mr. Geddings has not only published his meteorological text in both Spanish and English, but has added, in both languages, an excellent article on coffee cultivation by Capt. A. C. Hansard, of Luquillo, which will be helpful to any who may think of undertaking a plantation in Porto Rico.

THE WEATHER OF THE MONTH.

By ALFRED J. HENRY, Chief of Division of Records and Meteorological Data.

PRESSURE.

Atmospheric pressure was considerably higher than usual over all districts save the southern Plateau and the upper Missouri Valley. As compared with the preceding month pressure rose over the region extending from the Lakes and lower Missouri Valley southward to the Gulf and Mexican frontier, and fell along the northern boundary from the headwaters of the Missouri eastward to the mouth of the St. Lawrence. Pressure also fell markedly in California, Nevada, and Arizona.

TEMPERATURE OF THE AIR.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	10	65.3	+ 2.1	+ 1.0	+ 0.2
Middle Atlantic	12	72.7	+ 1.8	− 2.0	− 0.3
South Atlantic	10	78.6	+ 1.5	− 1.8	− 0.3
Florida Peninsula	7	80.4	+ 0.6	+ 1.0	+ 0.2
East Gulf	7	80.0	+ 1.1	− 5.6	− 0.9
West Gulf	7	79.3	+ 0.3	− 6.0	− 1.0
Ohio Valley and Tennessee	12	75.5	+ 1.5	− 4.2	− 0.7
Lower Lake	8	68.3	+ 1.3	+ 1.3	+ 0.2
Upper Lake	9	63.3	+ 0.9	− 5.1	− 0.8
North Dakota	7	63.2	− 1.7	−19.2	− 3.2
Upper Mississippi	11	72.3	+ 1.1	− 9.3	− 1.6
Missouri Valley	10	71.6	+ 0.6	−12.0	− 2.0
Northern Slope	7	61.7	− 1.1	−24.3	− 4.0
Middle Slope	6	72.0	+ 0.4	−10.6	− 1.8
Southern Slope	6	61.9	− 1.7	− 0.5	− 0.1
Southern Plateau	13	76.1	− 1.7	− 5.1	− 0.8
Middle Plateau	9	64.2	− 0.6	− 9.3	− 1.2
Northern Plateau	10	59.5	− 2.0	−11.8	− 2.0
North Pacific	9	55.2	− 2.6	−11.2	− 1.9
Middle Pacific	5	62.0	+ 0.1	− 1.2	− 0.2
South Pacific	4	66.8	+ 0.2	− 1.5	− 0.2

The month was slightly cooler than usual in parts of the upper Lake region and generally throughout the Rocky Mountain and Plateau districts. It was warmer than usual in the great Valley of California, and generally east of the Mississippi River. Maximum temperatures of 100° and over occurred in the interior of the South Atlantic States, the Rio Grande Valley, and on the plains northward along the one hundredth meridian. Maximum temperatures ranging from 100° to 120° occurred throughout the desert regions of southern California, in Arizona and southern Utah.

In many localities the minimum temperatures of the month were remarkably low. Light to killing frosts were of frequent occurrence on the higher levels of Oregon, Idaho, Montana, Wyoming, and Colorado. Killing frosts occurred in parts of Hardin, Marion, and Allen counties, Ohio, on the morning of the 30th.

In Canada.—Professor Stupart says:

In no part of the Dominion did the mean temperature differ much from the average. The greatest departure was in Assiniboia and Alberta, where it was 3° to 4° below, and the greatest departure above was in various small districts in the vicinity of Lakes Huron, Erie, and Ontario, where it was about 3°. In Manitoba, Quebec, and the Maritime Provinces, the temperature was either just normal or a little above.

PRECIPITATION.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		*Inches.*	*Inches.*
New England	10	2.46	83	−0.5	−0.7
Middle Atlantic	12	2.64	73	−1.0	−1.5
South Atlantic	10	3.36	65	−1.8	−2.6
Florida Peninsula	7	5.48	80	−1.4	−1.2
East Gulf	7	4.29	84	−0.8	−7.8
West Gulf	7	4.19	108	+0.3	−4.1
Ohio Valley and Tennessee	12	2.73	65	−1.5	−1.7
Lower Lake	8	1.79	50	−1.8	−2.4
Upper Lake	9	3.92	105	+0.2	−1.7
North Dakota	7	3.94	100	0.0	−0.5
Upper Mississippi Valley	11	4.78	104	+0.2	+1.4
Missouri Valley	10	4.51	102	+0.1	−1.8
Northern Slope	7	1.65	62	−1.0	0.0
Middle Slope	6	5.16	163	+2.0	+0.4
Southern Slope	6	5.61	160	+2.1	+0.8
Southern Plateau	9	0.63	147	+0.2	−1.7
Middle Plateau	13	0.78	162	+0.3	+0.8
Northern Plateau	10	0.54	40	−0.8	−1.2
North Pacific	9	1.46	62	−0.9	+4.2
Middle Pacific	5	0.47	82	−0.1	−1.9
South Pacific	4	0.61	555	+0.5	−1.7

Precipitation was unevenly distributed. Torrential rains fell in many places, while drought prevailed in others. The

drought in southern New England was broken during the first half of the month. Heavy rains fell over portions of Texas causing the most disastrous floods in the history of the State. Heavy rains also fell in Kansas and over a considerable strip of territory extending in a northeasterly direction to Lake Superior.

In Canada.—Professor Stupart says:

The rainfall has been below average in the southern part of Ontario from the upper St. Lawrence Valley to the St. Clair River, and particularly so in the counties bordering on Lakes Erie and Ontario; in northern Ontario and quite generally in the other provinces it was either equal to or above average, the most marked excess being along the north shores of the Georgian Bay and Lake Superior, and thence westward to Alberta.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 4, 22, 23, 30. Arizona, 2, 22, 23, 24, 25. Arkansas, 8, 23. California, 2. Colorado, 2, 6, 7, 8, 9, 13, 16, 20, 21, 22, 23, 25, 28. Connecticut, 20, 24. Florida, 1, 2, 3, 4, 15. Georgia, 29. Idaho, 3, 4, 5, 12, 13, 19, 26. Illinois, 1, 2, 5, 6, 23, 24. Indiana, 1, 3, 7, 18, 20. Iowa, 2, 13, 14, 17, 18, 19, 22. Kansas, 1, 2, 3, 4, 13, 14, 22, 25, 28. Kentucky, 9. Louisiana, 5, 23, 25. Maine, 20, 27. Maryland, 1, 2, 6, 9, 21, 24. Massachusetts, 19, 20, 24. Michigan, 5, 6, 12, 13, 18, 19, 21. Minnesota, 9, 10, 11, 12, 17, 23. Mississippi, 4, 7, 23, 28. Missouri, 1, 4, 14, 28. Montana, 5, 8, 11, 12, 13, 20, 22, 25, 26. Nebraska, 1, 2, 3, 7, 8, 9, 10, 11, 12, 13, 15, 16, 18, 22, 23, 24, 25, 26. New Hampshire, 5, 19, 20. New Jersey, 6, 15, 20, 24. New Mexico, 15, 16, 28. New York, 6, 20, 21, 23, 24, 25, 28. North Carolina, 8, 9, 21, 29. North Dakota, 3, 10, 15, 16, 19, 21, 22, 23, 29, 30. Ohio, 1, 6, 19, 20, 24, 27. Oklahoma, 1. Oregon, 24. Pennsylvania, 1, 5, 6, 20, 23, 24, 28. Rhode Island, 24. South Carolina, 1, 2, 11, 28, 29. South Dakota, 1, 2, 4, 10, 21, 26. Tennessee, 8, 25, 28. Utah, 1, 2. Vermont, 19. Virginia, 1, 10, 25. Washington, 5, 26, 28. West Virginia, 1, 6, 20, 23, 24. Wisconsin, 2, 4, 12, 17, 18, 19, 22, 27. Wyoming, 1, 2, 3, 4, 19, 24.

WIND.

The maximum wind velocity at each Weather Bureau station for a period of five minutes is given in Table I, which also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Abilene, Tex	2	51	se.	Point Reyes Light, Cal.	1	60	nw.
Amarillo, Tex	1	54	w.	Do	2	60	nw.
Bismarck, N. Dak.	30	52	nw.	Do	5	50	nw.
Cape Henry, Va.	9	50	nw.	Do	11	70	nw.
Do	29	65	nw.	Do	12	70	nw.
Mount Tamalpais, Cal.	1	60	nw.	Do	13	72	nw.
Do	11	86	nw.	Do	24	58	nw.
Do	12	72	nw.	Do	25	50	nw.
Do	23	78	nw.	Sioux City, Iowa	3	57	s.
Do	24	55	nw.	Williston, N. Dak.	6	52	nw.
New York, N. Y	29	66	nw.				

LOCAL STORMS AND TORNADOES.

Severe local storms, some of which were tornadic in violence, occurred on the following dates and in the States named:

1st, Kansas and Indiana; 2d and 3d, Iowa; 4th, Wisconsin and Iowa; 5th and 8th, Indiana; 10th, North Carolina; 11th, Iowa; 12th, Wisconsin; 13th, Nebraska and Iowa; 17th, Minnesota, Wisconsin, and Iowa; 19th, Wisconsin; 20th, Illinois, New York, and Colorado; 21st, Nebraska and Iowa.

Much damage was done by lightning. Reports were received showing the death of 130 persons from lightning stroke.

HUMIDITY.

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
	%			%	
New England	74	− 6	Missouri Valley	72	+ 3
Middle Atlantic	71	− 2	Northern Slope	55	− 1
South Atlantic	75	− 3	Middle Slope	61	+ 2
Florida Peninsula	78	− 3	Southern Slope	66	+ 6
East Gulf	72	− 3	Southern Plateau	33	+ 5
West Gulf	76	+ 2	Middle Plateau	33	− 4
Ohio Valley and Tennessee	69	− 1	Northern Plateau	52	0
Lower Lake	67	− 5	North Pacific Coast	74	− 5
Upper Lake	73	0	Middle Pacific Coast	60	− 5
North Dakota	72	+ 4	South Pacific Coast	69	+ 5
Upper Mississippi	70	− 1			

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table VII, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Reports of 5,253 thunderstorms were received during the current month as against 5,455 in 1898 and 5,305 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 24th, 311; 1st, 308; 20th, 276; 14th, 272; 28th, 261.

Reports were most numerous from: Pennsylvania, 265; Iowa, 256; Illinois, 248; Nebraska, 240; New York, 229.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, 19th to 27th.

The greatest number of reports were received for the following dates: 29th, 88; 28th, 38; 30th, 12.

Reports were most numerous from: New York, 24; Wisconsin, 15; Iowa, Massachusetts, and South Dakota, 13; Minnesota, 12.

In Canada.—Auroras were reported as follows: Grand Manan, 29th; Quebec, 3d, 28th, 29th; Montreal, 28th, 29th; Toronto, 28th, 29th; Kingston, 28th, 29th; Port Stanley, 28th; Saugeen, 28th; Minnedosa, 9th, 27th; Swift Current, 29th.

Thunderstorms were reported as follows: Sydney, 14th; Halifax, 6th; Grand Manan, 5th, 6th, 7th, 26th; Yarmouth, 6th, 16th, 25th; Ottawa, 20th; Charlottetown, 26th; Chatham, 21st, 29th; Father Point, 13th, 21st; Quebec, 1st, 5th, 17th, 20th, 21st, 23d, 24th; Montreal, 5th, 17th, 19th, 23d; Bissett, 18th, 26th; Toronto, 6th, 7th, 8th, 14th; White River, 4th, 6th, 14th; Kingston, 5th, 6th, 7th, 19th, 20th, 23d; Port Stanley, 1st, 4th, 5th, 6th, 7th, 14th; Saugeen, 5th, 6th, 22d; Parry Sound, 4th, 6th, 7th, 14th, 20th, 22d; Port Arthur, 4th, 5th, 7th, 12th, 13th, 17th, 25th; Winnipeg, 4th, 11th, 17th, 18th, 21st, 27th, 29th, 30th; Barkerville, 23d; Minnedosa, 1st, 3d, 16th, 17th, 23d, 26th, 28th; Qu'Appelle, 11th, 12th, 20th, 22d, 23d, 26th; Medicine Hat, 10th, 11th,

22d, 26th; Swift Current, 7th, 10th, 11th, 20th, 22d, 26th, 28th, 29th, 30th; Prince Albert, 10th, 22d, 23d, 26th; Edmonton, 2d, 25th; Battleford, 11th, 22d, 26th; Bermuda, 16th, 18th, 27th, 30th.

SUNSHINE AND CLOUDINESS.

There was more than the normal amount of sunshine in the majority of districts.

The distribution of sunshine is graphically shown on Chart VII, and the numerical values of average daylight cloudiness, both for individual stations and by geographical districts, appear in Table I.

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	5.1	0.0	Missouri Valley	4.7	—0.1
Middle Atlantic	4.7	—0.3	Northern Slope	4.7	—0.1
South Atlantic	4.2	—0.7	Middle Slope	4.2	+0.5
Florida Peninsula	4.9	—0.6	Southern Slope	4.0	—0.4
East Gulf	4.1	—0.7	Southern Plateau	2.2	+0.3
West Gulf	5.0	+0.4	Middle Plateau	2.6	—0.4
Ohio Valley and Tennessee	4.2	—0.8	Northern Plateau	4.3	—0.8
Lower Lake	3.8	—1.1	North Pacific Coast	6.0	—0.1
Upper Lake	5.0	—0.2	Middle Pacific Coast	2.0	—1.2
North Dakota	4.4	—0.8	South Pacific Coast	3.4	+0.1
Upper Mississippi	4.6	—0.4			

DESCRIPTION OF TABLES AND CHARTS.

By ALFRED J. HENRY, Chief of Division of Records and Meteorological Data.

For text descriptive of tables and charts see page 164 of REVIEW for April, 1899.